May 3, 1932. A. G. SHERMAN 1,857,122

ICE CUBE FORMING AND DISPENSING DEVICE

Filed Jan. 16, 1930

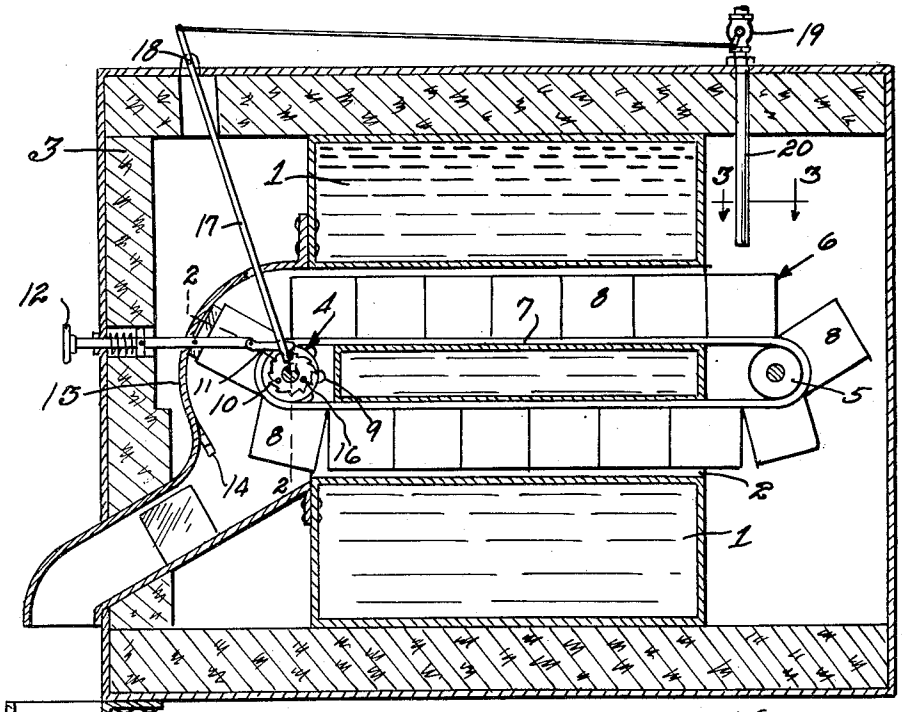


Fig. 4

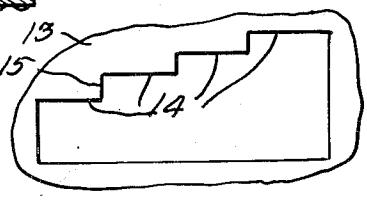


Fig. 1

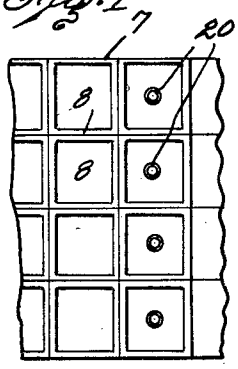


Fig. 3

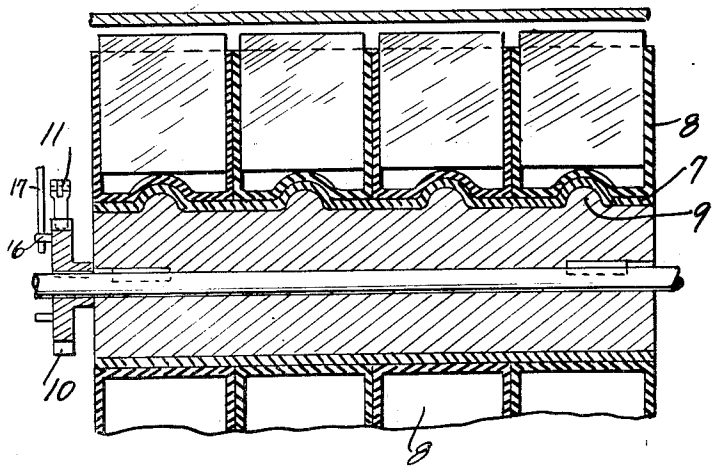


Fig. 2

INVENTOR.
ALVIN G. SHERMAN

BY Stuart C. Barnes

ATTORNEY.

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UNITED STATES PATENT OFFICE

ALVIN G. SHERMAN, OF GROSSE POINTE, MICHIGAN

ICE CUBE FORMING AND DISPENSING DEVICE

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This invention relates to an ice cube forming and dispensing device, and has to do particularly with novel means, in combination with sharp freezing apparatus, for automatically forming and delivering ice cubes.

Ice cube trays adapted to be inserted in heat conducting relation with lowsides of mechanical refrigerating systems have been of several different types, and recently a sharp freezing container for forming ice cubes has been designed which embodies the use of flexible non-metallic walls for permitting quick easy removal of the ice cubes.

The present invention preferably embodies the use of ice cube forming containers formed of flexible non-metallic material and it is the object of the present invention to utilize such flexible non-metallic containers in a novel manner whereby the ice cubes are formed and discharged without removing the container or containers from the sharp freezing cabinet. More specifically, the present invention comprises forming and shaping means adapted to move in a closed path and means for controlling the movement of said forming means in said closed path whereby to automatically discharge and form ice cubes and to automatically fill the respective containers with the liquid to be frozen. In this case the ice cube containers are preferably positioned closely adjacent the sharp freezing unit during all points of their travel.

Other novel features reside in the details and arrangement of the various parts as will be more clearly brought out in the specification and claims.

In the drawings:

Fig. 1 is a vertical sectional view of an ice cube forming and dispensing device embodying the features of the present invention.

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1 and illustrating one manner of ejecting the ice cubes from the containers.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is an enlarged fragmentary view of the outlet and illustrating one means of controlling the individual discharge of ice cubes.

Due to the many different types and designs of sharp freezing units, it will be obvious that the present invention will vary widely in accordance with the particular installation. In the drawings I have shown a somewhat standard design of sharp freezing unit of the flooded or brine tank type. This sharp freezing unit is indicated as at 1 and in the form shown is provided with a central opening 2.

The sharp freezing unit may be embodied in any type of cabinet 3 and within this cabinet I preferably provide two members 4 and 5 adapted to receive a continuous ice cube container member which may be designated 6. This ice cube container is preferably formed in a closed path and is also preferably formed of rubber or similar flexible material to which ice does not readily adhere.

The ice cube container is preferably fabricated in the form of a belt; that is, it is preferably provided with a belt member 7 and a plurality of containers 8 which are preferably integral with the belt. These containers 8 are preferably formed in rows, as best shown in Fig. 3, and may be separated laterally as well as longitudinally. However, in the preferred form, these rows of containers are only separated row from row as shown in Fig. 1.

The members 4 and 5 are preferably in the form of suitable rollers, one forming the driving member and the other the driven member, and while the present invention is not concerned with the form of the driving means it will be obvious that these members may be relatively adjustable. The member 4 preferably has formed thereon a series of projections or teeth 9, and these teeth are so arranged whereby one or more teeth will contact with the bottom wall of each container 8 as it is moved around in its endless path. The purpose of such teeth 9 is not only to assist in actuating the container member 6 but also to assist in ejecting the formed ice cubes from the individual containers or pockets.

The shaft which carries the members 4 is also preferably provided with suitable ratchet teeth 10 adapted to be actuated by a suitable pawl 11 which in turn is connected with an actuating member 12 on the outside

of the cabinet. The relationship between the pawl 11 and the ratchet teeth 10 is preferably such that the container belt is moved a distance to discharge a single cube at a time.

This is accomplished by providing a shell member 13 which is arcuate in shape and which terminates in a series of stepped edges 14. For instance, if the belt is so arranged as to present four containers in each row as shown in Fig. 3, then the steps which separate the edges 14 are so divided that the width of all the steps equals approximately the width of one container or ice cube. The relationship between said pawl and ratchet is also such that the belt is moved each time only the distance 15 of one step. Of course, it will be obvious that any number of cubes may be dispensed simultaneously if desired, but in the ordinary domestic unit one cube at a time is desirable and hence the present showing.

The ratchet wheel 10 is preferably provided with pins 16 which are spaced in accordance with the number of container in each row of containers. A rod 17 is pivotally mounted at any desired point, say at 18, and the movement of this rod is designed to actuate a measuring valve 19, such valve being constructed to deliver a measured quantity of liquid upon actuation, and in the present case the valve should be of such size as to deliver enough liquid to fill a container 8. A plurality of tubes 20 are preferably provided for delivering the liquid into the separate containers and in this connection either a single or a multiple number of valves 19 may be used.

The pins 16 are preferably so arranged that the rod 17 will be actuated when the containers 8 approach a position substantially directly and centrally beneath the conduits 20. If the belt is moved by a step by step movement in accordance with the width of the steps 15 then it will be obvious that the pin 16 will be so positioned that a short movement of each container as it passes centrally below the conduit 20 will be effective to discharge the required amount of liquid into the container or containers.

As the actuating pin 16 is moved on past by further actuation of the member 12, then of course the valve 19 will be returned to normal position so that the required amount of liquid will flow thereinto in the correct measured quantity.

In operation, movement of the member 12 will actuate the container belt sufficiently to move a cube of ice a distance so it will pass by one of the edges 14. Due to the fact that this cube of ice has been pressed outwardly by one of the projections 9, it will be obvious that it will be discharged into the dispensing chute as it moves past the edge 14. In this connection it will be noted that the shell member 14 is preferably formed of or faced with rubber or similar material to which ice does not readily adhere so that if the belt should stay in one position for any length of time the cube of ice will not adhere to such shell. Continued actuation of the plunger 12 will, of course, advance the belt to discharge a cube of ice each time it is actuated. As a row of containers 8 approach a position centrally beneath the conduit 20, as best shown in Fig. 1, one of the pins 16 will contact with the end of the rod 17 whereby to actuate the measuring valve 19 and discharge a predetermined amount of liquid into each container or containers. As the belt is advanced under continued use, the liquid in the containers will freeze as the container pass through the freezing zone.

It will be obvious that the supply of ice cubes is preferably unlimited, as not only may the belt be made much wider to accommodate a greater number of containers but it will also be obvious that the belt may be made much longer.

The entire belt is preferably substantially surrounded by the cooling unit so that the pockets or containers are cooled after dispensing the ice cubes and up until the time the water is injected thereinto. This will rapidly promote the freezing action particularly as contrasted with the present use of ice trays whereby they are materially warmed when the ice is removed therefrom. It will be understood that the details of the embodiment illustrated are more or less diagrammatic for the reason that any number of different arrangements could be designed for carrying out substantially the same results.

What I claim is:

1. Means for freezing and dispensing ice cubes, comprising a series of containers formed of a flexible material to which ice does not readily adhere and shaped to form the ice cubes, said containers being connected together to form a belt, sharp freezing means forming a freezing zone, means for moving said belt through said zone, and means for distorting the containers for removal of ice therefrom.

2. Sharp freezing apparatus, comprising a cabinet, a sharp freezing unit within the cabinet, a plurality of flexible containers for receiving the substance to be frozen, means for moving said containers along a path adjacent said sharp freezing unit, and means for distorting the containers to eject the frozen articles from the containers without removing the containers from the cabinet.

3. Sharp freezing apparatus, comprising a cooling unit, a plurality of containers connected together in the form of a belt, the bottom portion of said containers being flexible, means for moving the containers in a closed path adjacent the cooling unit, and means for advancing and automatically ejecting the frozen articles from said containers.

4. Sharp freezing apparatus, comprising a cooling unit, a plurality of containers connected together in the form of a belt, the bottom portion of said containers being flexible, and means for moving the containers in a closed path adjacent the cooling unit, said means also serving to flex the bottom of the containers to assist in removing the frozen articles.

5. Sharp freezing apparatus, comprising a sharp freezing unit, a plurality of containers formed in rows and connected together to form a belt, means for moving said containers adjacent the cooling unit, means for ejecting the frozen articles therefrom, and means controlling the successive dispensing of articles from the containers in a single row.

6. Sharp freezing apparatus, comprising sharp freezing containers, the bottom of said containers being formed of flexible material, means for moving said containers adjacent said cooling unit and for flexing the bottom of said containers to assist in removing the frozen articles therefrom, and means for controlling the successive release of frozen articles from the containers.

7. Sharp freezing apparatus, comprising sharp freezing containers, the bottom of said containers being formed of flexible material, means, for moving said containers adjacent said cooling unit and for flexing the bottom of said containers to assist in removing the frozen articles therefrom, means for controlling the successive release of frozen articles from the containers, and means controlled by said means for moving the containers for automatically filling the containers with the substance to be frozen.

8. Ice cube forming and dispensing apparatus, comprising a cabinet, a cooling unit in the cabinet, a plurality of containers formed of flexible material, means operable from a point outside the cabinet for moving said containers in heat conducting relation with said cooling unit, and means actuated by movement of said operating means for automatically filling said containers and ejecting the ice cubes therefrom.

9. Ice cube forming and dispensing apparatus, comprising a cabinet, a cooling unit in the cabinet, a plurality of containers, means operable from a point outside the cabinet for moving said containers into heat conducting relation with said cooling unit, means for removing the ice cubes from the containers, and means cooperating with the means operable from a point outside the cabinet for controlling the dispensing of ice cubes from the cabinet.

10. Ice cube forming and dispensing apparatus, comprising a cabinet, a cooling unit in the cabinet, a plurality of containers, means for moving said containers in heat conducting relation with said cooling unit, means for successively filling the containers, means for removing the frozen ice cubes from the containers while the containers are positioned within the cabinet, and means having a portion thereof operable from a point outside the cabinet for controlling the dispensing of ice cubes from the cabinet.

In testimony whereof I affix my signature.

ALVIN G. SHERMAN.